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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,405	02/13/2002	Mario Meggiolan	Q68479	3986
3624	7590	03/09/2004	EXAMINER	
VOLPE AND KOENIG, P.C. UNITED PLAZA, SUITE 1600 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103			FISCHER, JUSTIN R	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/073,405

Applicant(s)

MEGGIOLAN, MARIO

Examiner

Justin R Fischer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 20-23, 40-45, 47 and 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16-19, 24-39, 46 and 48 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4 and 8.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-40 and 46-49, drawn to a method of fabricating a bicycle wheel hub, classified in class 156, subclass 184.
  - II. Claims 41-44 drawn to an apparatus for fabricating a bicycle wheel hub, classified in class 156, subclass 443.
  - III. Claim 45, drawn to a bicycle hub, classified in class 301, subclass 5.309.
2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process, such as a method of making a spool, a hub for image recording medium, a hub for a tire other than a bicycle, or any additional molded article.
3. Inventions I and III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product as claimed can be made by

another and materially different process, such as one in which the hub is formed of metal as opposed to layers of fabric.

4. Inventions II and III are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case, the product as claimed can be made by another and materially different apparatus, such as one that does not include an expandable core or one in which the hub is not a molded article.

5. Upon election of Invention I, a further species restriction is applicable. This application contains claims directed to the following patentably distinct species of the claimed invention: an expandable core formed of a synthetic material (claims 5-8 and 46) or a metal material (claims 20-23, 40, 47, and 49).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-4, 9-19, 24-39, and 48 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

7. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

8. During a telephone conversation with Anthony Volpe on February 5, 2004 a provisional election was made with traverse to prosecute the invention of a method of making a wheel hub using an expandable core made of a synthetic material, claims 1-19, 24-39, 46, and 48. Affirmation of this election must be made by applicant in replying to this Office action. Claims 20-23, 40-45, 47, and 49 are withdrawn from further

consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 5-7, 19, and 46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 5-7 and 46, applicant defines a "thermal dilation coefficient" having units of mm/°C. However, it appears that this property actually has units of °C<sup>-1</sup> since the parameter is commonly defined as the change in length or distance divided by the original length and the change in temperature. Applicant is asked to clarify this property.

Regarding claim 19, the language "said two elements" appears in lines 1 and 2. However, there is no antecedent basis for this language in claim 19 or claims 1 or 14 from which claim 19 depends. It is noted that the "two elements" are only defined in claim 15. It is suggested that applicant change the dependency of claim 19 to claim 15 in order to provide proper antecedent basis.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-4 and 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Arredondo (US 5,246,275). Arredondo is directed to a lightweight bicycle tire construction formed by the following method: (a) providing an inflatable (expandable) mandrel having a rim portion, a spoke portion, and a hub portion, (b) wrapping a number of fabric layers having a plastic material matrix around each of the portions noted above to form a layered tubular body, (c) placing the thus covered mandrel in a mold, (d) increasing the temperature of the mold to cure the plastic material while the mandrel is inflated/expanded (this step applies pressure to the layers and compresses them against the mold surface), and (e) removing the layered tubular body from the mold and the mandrel (Column 5, Lines 10-30).

Regarding claim 2, as noted above, the plastic material is cured at an elevated temperature while the layers are compressed against the mold surface (temperature and pressure are simultaneously applied).

As to claim 3, the fabric layers are compressed against the mold surface (radial direction).

With respect to claim 4, Arredondo includes a cooling step after the plastic material is cured (Column 6, Lines 50-51).

As to claim 9, Arredondo suggests the use of a wide variety of fibers, including aramid fibers, carbon fibers, and glass fibers (Column 2, Lines 59-62).

Regarding claim 10, Arredondo describes the use of a wide variety of thermosets (Column 4, Lines 21-34).

With respect to claims 11-13, Arredondo describes an embodiment in which the composite is cured at a temperature of 177 degrees Celsius for about two hours. Furthermore, the reference suggests that the curing temperature and time varies as a function of the type of plastic material used (Column 12, Lines 60-65).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 5, 6, 14, 16-19, 24-39, 46, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo.

Applicant is advised that should claims 5 and 24 be found allowable, claims 46 and 48, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

As to claims 5, 6, and 46, Arredondo is directed to a method of making a bicycle wheel having a hub, wherein multiple layers of fiber fabric are arranged on an inflatable mandrel. In describing the mandrel, Arredondo suggests that it is formed of a "high temperature resistant elastic material" (Column 12, lines 32-38) since the curing step occurs at a high temperature. The exemplary example of Arredondo has a curing



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temperature of about 180 degrees Celsius (Column 12, Lines 61-65), which suggests that the mandrel has a heat resistance of at least 80 degrees Celsius. As to the dilation coefficient, one of ordinary skill in the art at the time of the invention would have recognized the language "highly elastic material" of Arredondo as suggesting materials having a dilation coefficient in accordance to the limitations of the claimed invention. Thus, the use of a material having a dilation coefficient greater than  $5 \times 10^{-15}$ , more preferably greater than  $9 \times 10^{-5}$ , would have been obvious to one of ordinary skill in the art at the time of the invention since these values define highly expandable/elastic materials and such materials are desired in the method of Arredondo, there being no conclusive showing of unexpected results to establish a criticality for a material having the claimed dilation coefficient.

Regarding claims 14 and 16-18, Arredondo teaches a bicycle wheel construction having a rim portion, spoke portion, and hub portion. As depicted in Figures 1 and 3, the hub portion does not appear to be bell-shaped (cylindrical center section and two wider diameter ends). However, one of ordinary skill in the art at the time of the invention would have found it obvious to form the hub portion with such a shape because a majority of hubs are formed with wider diameter ends- while not depicted as such by Arredondo, this shape represents the most common hub construction in a large number of wheels, including bicycle wheels. It is noted that Arredondo states that the mold has a contoured surface that is shaped so as to impart the desired shape onto the tubular body, such that if a bell-shaped hub were desired, one of ordinary skill in the art at the time of the invention would have been able to form the mold with such a design.

This design is seen to constitute a hub in which there is a progressive increase in thickness from the center to the ends. Alternatively, the hub could be constructed with a less progressive or steeper increase in thickness as is required by claim 18, wherein each of the claimed designs would have been within the purview of one of ordinary skill in the art at the time of the invention depending on the desired aesthetic characteristics and desired function of the hub. Lastly, applicant has not provided any conclusive showing of unexpected results to establish a criticality for the claimed hub design.

With respect to claims 24-39 and 48, in the method of Arredondo, a plurality of fiber reinforced plies or layers are wrapped on a mandrel. Arredondo states that the layers can be unidirectional or they can be woven and further that the use of plies having a variety of orientations is preferred as set forth in Table 1. Arredondo also states that the layers can be cut to any desired shape (Column 13, Lines). One of ordinary skill in the art at the time of the invention would have found it obvious to include layers in only some regions (layers are not continuous over entire extent of mandrel) in order to obtain a desired thickness. For example, if a larger thickness were desired in an end region as compared to a central region, additional layers would only be applied at the end regions. In particular, one of ordinary skill in the art at the time of the invention would have been able to apply the desired number of layers in certain regions to obtain the desired orientation and thickness. It is noted that the language of claim 24 is being viewed as requiring at least one layer that is only arranged over the core end portion and at least one layer that extends over the entire core axis.

Regarding claims 25-30, as noted above, Arredondo suggests that the respective layers can be cut in any shape.

As to claim 31, Table 1 of Arredondo describes the use of alternating plies.

Regarding claim 32-39, as noted above, one of ordinary skill in the art at the time of the invention would have been able to appropriately select the desired shape of each ply and the desired location of each ply. Table 1 shows the use of woven layers and unidirectional layers and further shows the use of alternating ply orientations.

15. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo as applied in the rejection of claim 6 above and further in view of DuPont (US 5,484,506). In describing the inflatable mandrel or bladder, Arredondo requires a high temperature resistant elastic material, such as rubbers or silicone based elastic materials. While Arredondo fails to expressly suggest the use of Teflon (PTFE), one of ordinary skill in the art at the time of the invention would have found it obvious to form the inflatable mandrel or bladder of Arredondo from Teflon since it represents an extremely well known material that is used in wide variety of articles, including inflatable mandrels, and has high temperature resistance, high expansion properties as compared to other polymers (shows elasticity), and high anti-stick properties. For example, DuPont describes the use of an inflatable mandrel made of "heat resistant, non-stick material such as PTFE" (Column 2, Lines 20-22). It is emphasized that the examples of Arredondo are only exemplary and one of ordinary skill in the art at the time of the invention would have readily appreciated the use of a wide variety of materials having high temperature resistance and elastic properties (satisfied by Teflon). Also, the

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additional materials of claim 7 would have been obvious to one of ordinary skill in the art at the time of the invention since they also represent well-known materials having high heat resistance and high elastic characteristics.

It is further noted that while Arredondo describes the use of an inflatable mandrel, solid, expandable mandrels represent a well-known alternative that are extensively used in the manufacture fabric reinforced composite articles.

16. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo and further in view of Barrier (US 5,192,384). The method of Arredondo includes the step of placing fabric layers on an inflatable mandrel, as best depicted in Figure 9 (dotted line represents mandrel). In this instance, the mandrel is a single piece, inflatable mandrel and has the specific construction in order to facilitate removal after curing (Column 12, Lines 20-32). One of ordinary skill in the art at the time of the invention would have found it obvious to use a two-piece mandrel in the method of Arredondo since multi piece, inflatable mandrels are commonly used in a wide variety of industries. For example, Barrier is similarly directed to the arrangement of fabric layers over a mandrel, wherein said mandrel can be inflatable and further can be formed of multiple pieces (Column 5, Lines 20-35). Thus, single and multi-piece, inflatable mandrels are recognized as equivalent alternatives and one of ordinary skill in the art at the time of the invention would have readily appreciated either in the method of Arredondo.

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***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lew (US 6,398,313) discloses a method of making a composite bicycle rim construction comprising the steps of applying a plurality of fabric layers to an expandable mandrel, placing the thus covered mandrel in a mold, and increasing the temperature of the mold so as to cure the fabric layers while the increasing the pressure of the respective layers against the mold surface.

Wehmeyer (US 4,595,242), Slankard (US 6,018,869), Nakajama (US 6,409,278), and Thompson (US 3,865,220) recognize the well-known use of composite materials in the manufacture of hubs since it provides high durability and contributes to the reduction of weight.

Tatehata (JP 630684041) is directed to a wheel (including hub part) made of fiber reinforced plastic, wherein a plurality of glass fiber layers are arranged on a mold surface.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Justin Fischer

February 26, 2004

  
JEFF W. AFTERGOOD  
PRIMARY EXAMINER  
GROUP 1300